

## TUBERCULOSIS AND INDOOR AIR QUALITY

Tuberculosis (TB) is a mycobacterial disease that is important as a cause of disability and death in many parts of the world. Initial infection with TB usually goes unnoticed; tuberculin sensitivity appears within a few weeks. For many years, numerous countries worldwide have shown downward trends of TB. However, new multi-drug resistant strains of TB and the growing population of HIV-infected individuals have increased the incidence of TB once more. The resurgence of TB infections has health officials once again analyzing environmental conditions as possible control mechanisms.

The World Health Organization recently reported that tuberculosis will claim 30 million lives over the next 10 years unless more money is found to prevent its spread. "'Tuberculosis is the world's most neglected health crisis,' said Dr. Arata Kotchi, head of the agency's tuberculosis program. 'How can we ignore a germ that already infects one in every three people on the planet?'" The health agency reportedly declared tuberculosis a global emergency in April, noting that it killed more adults each year than all other infectious diseases combined. The agency estimates that there are three million tuberculosis deaths each year. Most of the people infected with tuberculosis are in the developing world, but the disease is spreading in industrialized

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countries. In the United States, 15 million people are infected with tuberculosis. (1)

Mycobacteria may only be transmitted by water droplets inhaled deeply into the lungs. (2) Direct invasion of TB through mucous membranes or breaks in the skin may occur, but is extremely rare. The degree of communicability depends on the number of bacilli discharged, the virulence of the bacilli and opportunities for their aerosolization by coughing, sneezing, talking or singing. Early studies of TB suggested a direct relationship between shared air supply and infection: in addition to individual susceptibility, exposure to an infected air stream was a factor in the spread of TB. (2)

Dr. Edward Nardell, a TB Control Officer for the Massachusetts Department of Public Health, has analyzed the potential impact of outdoor air supply rates on infection rates of TB. Nardell investigated a case where 27 out of 67 building occupants (40%) were infected from the spread of the disease from a single individual who had contracted the disease. According to Nardell's data, reducing the outdoor air rate to 5 cfm/person would have doubled the rate of infection, whereas increasing it to 25 cfm/person would have reduced it by a third. Raising the ventilation to 35 cfm/person would reduce the rate of infection by half. Nardell concluded that increasing ventilation reduces the

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